

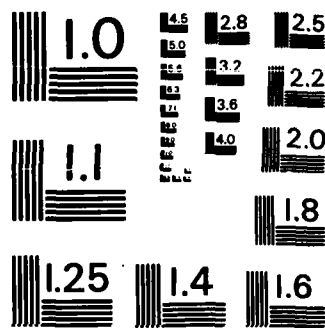
RD-A161 851 CERTIFICATION TEST CNU-399/E MAVERICK MISSILE CONTAINER 1/1
(U) AIR FORCE PACKAGING EVALUATION AGENCY
WRIGHT-PATTERSON AFB OH E J KOMALSKI OCT 85

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Report No. 85-R-05
AFPEA Project No. 84-P-107

AD-A161 851

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CERTIFICATION TEST
CNU-399/E MAVERICK MISSILE CONTAINER

HQ AFLC/DSTZ
AIR FORCE PACKAGING EVALUATION AGENCY
Wright-Patterson AFB Ohio 45433-5999

October 1985

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AFPEA PROJECT NO. 84-P-107

TITLE: Certification Test, CNU-399/E Maverick Missile Container

ABSTRACT

The Air Force Packaging Evaluation Agency (AFPEA) Wright-Patterson AFB OH 45433-5999 was requested by ASD/TAM to conduct a certification test on a prototype CNU-399/E Maverick Missile Container.

Tests were conducted in accordance with Federal Test Method Standard (FTMS) No. 101, Military Standard 648 (MIL-STD-648), Military Standard 810 (MIL-STD-810), and Military Standard 1489 (MIL-STD-1489).

Results of the tests conducted on container Serial No. 83-0021 are acceptable. The prototype CNU-399/E Maverick Missile Container will adequately protect the Maverick Missile, AGM-65A/B/C/D/E/F all-up-around, and the Maverick missile less both the guidance unit and the hydraulic actuating system during worldwide shipments in the public domain.

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INTRODUCTION:

BACKGROUND: HQ Aeronautical Systems Division (ASD/TAM), Wright-Patterson AFB, OH 45433-5999 requested assistance from the Air Force Packaging Evaluation Agency (AFPEA) to conduct certification testing on a new Maverick missile container. The prototype container was fabricated by a contractor and shipped to AFPEA for testing.

PURPOSE: The purpose of this project was to determine if the prototype container CNU-399/E will protect its contents, the AGM-65A/B/C/D/E/F All-UP-Round (AUR) Maverick Missile (Figure 1) and components (Figure 2) during worldwide shipments in the public domain.

TEST SPECIMEN: ONE CNU-399/E Maverick Missile container, serial number 83-0021 (Figure 3 and 4) fabricated from fiberglass material (resin transfer molded) by Plastics Research Corporation (PRC) 12837 Bettencourt Street, Cerritos, CA 90701 was used for certification testing. The container was designed to limit the transmission of shocks to its contents at a maximum of 40Gs resultant force and provide environmental protection to its contents.

TEST OUTLINE AND TEST EQUIPMENT: Tests were conducted in accordance with AFPEA container test plan, project No. 84-P-107, dated 10 May 85 (Table 1). Test methods and procedures used were as outlined in FTMS No. 101, MIL-STD-648, MIL-STD-810, and MIL-STD-1489. Instrumentation and equipment used are annotated in each test procedure.

TEST PROCEDURES AND RESULTS

LEAK TEST

Keywords: leaks, pitfire shock, rough handling, twisting strength, puncture

Test No. 1: The container was visually inspected as received from the contractor. The exterior and interior surfaces, markings, hardware, cushioning, strapping, and container seal were inspected for manufacturing imperfections. An inert Maverick Missile was installed in the container. A tri-axial accelerometer was mounted on the center of gravity of the missile, the container was closed, the tee-bolts were torqued to 100 inch pounds, and a leak test was performed. The pneumatic pressure and vacuum retention tests were performed in accordance with FTMS No. 101, Method 5009.1 paragraph 6.1 and 6.3 at 1.00 PSIG (pounds per square inch gauge). The failure criteria for each test was 0.050 PSIG for a 60 minute period.

Results: Results of the visual inspection are annotated in Table II. Torque values were measured below 100 inch pounds on 10

tee-bolts when received from PRC. The container weight was over the maximum allowable weight identified in the contract of 380 pounds. Overall, better than average workmanship was noted on the container. At the end of the 60 minute pressure/vacuum leak test period, the results were as follows:

Pressure loss during leak test, 0.009 PSIG
Vacuum loss during leak test, 0.018 PSIG

The results of the tests are acceptable.

REPETITIVE SHOCK

Test No. 2a: The repetitive shock test was conducted in accordance with MIL-STD-648 and FTMS No. 101, Method 5019.1. The container was placed on a L.A.B. Corporation, Skaneateles, NY 13152 vibration test machine (LWVH), Type 5000-96B, Serial Number 56801. The container was placed on, but not fastened to the platform. Restraining blocks were attached to the platform to prevent the container from moving off the platform. A clearance of approximately 1/2 inch in all directions was used for the restraint blocks to allow free movement of the container during the two-hour test period. With the container in position, the platform was vibrated until the container raised from the platform (1/16 inch feeler gauge clearance between bottom of container and platform) for a maximum platform acceleration of 1G.

Results: Visual inspection revealed no damage to the container. A maximum of 3.7 Gs at 4.3 Hz and a 74 degree F cushion temperature were recorded during the test. The results of the test are acceptable.

Test No. 2b: The repetitive shock test with a superimposed load (stacked three high and banded, Figure 5) was conducted in accordance with MIL-STD-648 and FTMS No. 101, Method 5019.1. The same procedure for testing the superimposed load used was as indicated in Test No. 2a.

Results: Visual inspection revealed no damage to the container. A maximum of 6.4 Gs at 4.0 Hz and a 74 degree F cushion temperature were recorded during the test. The results of the test are acceptable.

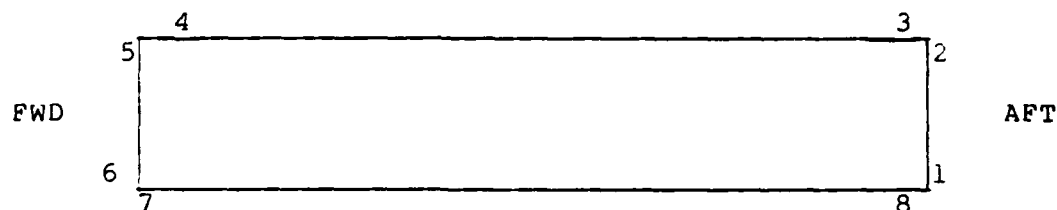
LEAK TEST

Test No. 3: The pneumatic pressure test was conducted in accordance with FTMS NO. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test 0.000 PSIG

The result of the test is acceptable.



CNU-399/E Maverick Missile Container, Serial No. 83-0021 corner marking for reference in test data.

ROUGH HANDLING TEST (LOW TEMPERATURE -40 DEGREE F)

Test No. 4a: The container was placed in a low temperature environmental chamber for a period of 24 hours at -40 degree F (Chart No. 1). The low temperature cornerwise-drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5005.1. The height of the drop was 20 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 18.2Gs was recorded during the test. The results of the test are acceptable.

Test No. 4b: The low temperature edgewise-drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5008.1. The height of the drop was 20 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 15.7 Gs was obtained during the test. The results of the test are acceptable.

Test No. 4c: The low temperature pendulum impact test was conducted in accordance with FTMS No. 101, Method 5012. The impact velocity was 10 feet/second, the drop height was 18.60 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 29.8 Gs was recorded during the test. The results of the test are acceptable.

LEAK TEST

Test No. 5: The pneumatic pressure test was conducted in accordance with FTMS No. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG. during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test, 0.016 PSIG.

The result of the test exceed the allowable limit of .013 PSIG.

ROUGH HANDLING TEST (HIGH TEMPERATURE +140 DEGREE F)

Test No. 6a: The container was placed in a high temperature environmental chamber for a period of 24 hours at +140 degree F (Chart No. 2). The high temperature cornerwise-drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5005.1. The height of the drop was 20 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 13.3 Gs was recorded during the test. The results of the test are acceptable.

Test No. 6b: The high temperature edgewise drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5008.1. The height of the drop was 20 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 15.3 Gs was recorded during the test. The results of the test are acceptable.

Test No. 6c: The high temperature pendulum impact test was conducted in accordance with FTMS No. 101, Method 5012. The impact velocity was 10 ft./sec., the drop height was 18.60 inches.

Results: Visual inspection revealed no damage to the container. A maximum of 32.7 Gs was recorded during the test. The results of the test are acceptable.

LEAK TEST

Test No. 7: The pneumatic pressure test was conducted in accordance with FTMS No. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test, 0.014 PSIG.

The result of the test exceeded the allowable limit of .013 PSIG.

ROUGH HANDLING TEST (AMBIENT)

Test No. 8: The container was stacked two high and banded. The ambient pendulum-impact test was conducted in accordance with FTMS No. 101, Method 5012. The impact velocity was 10 ft./sec., the drop height was 18.60 inches.

Results: On the second impact (End 5-6) the upper container moved forward over the lower container's stacking index 3 1/2 inches (Figure 6 and 7). This movement created excessive pressure on corners 4 and 7 and caused some noticeable damage to these areas. The hairline cracks measured 6 inches on corner 6, and 7 inches on corner 7. Visual inspection revealed no additional damage to the container. A maximum of 23.4 Gs was recorded during the test. The results of the test are acceptable.

Test No. 9: The stacked cornerwise-drop (rotational) test (Figure 8) was conducted in accordance with FTMS No. 101, Method 5005.1. The drop height was 17 inches.

Results: Visual inspection revealed no additional damage to the container. A maximum of 12.5 Gs was recorded during the test. The results of the test are acceptable.

Test No. 19: The stacked edgewise-drop (rotational) test was conducted in accordance with FTMS No. 101, Method 5008.1. The drop height was 17 inches.

Results: Visual inspection revealed no additional damage to the container. A maximum of 13.2 Gs was recorded during the test. The results of the test are acceptable.

LEAK TEST

Test No. 10: The pneumatic pressure test was conducted in accordance with FTMS No. 101, Method 5009.1. This test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test, 0.013 PSIG.

The result of the test is acceptable.

HOISTING STRENGTH TEST

Test No. 11: The hoisting strength test was conducted in accordance with MIL-STD-648, para 4.17.3.1 and 5.8.1. The containers were stacked 2 high banded and were hoisted by one lift point and left hanging for one hour (Figure 9). The test was continued by loading the container to five times its gross weight. The container was then hoisted by all of its lift points and left hanging for a period of one hour (Figure 10).

Results: Visual inspection revealed no damage to the container. The results of the tests are acceptable.

LEAK TEST

Test No. 12: The pneumatic pressure test was conducted in accordance with FTMS No. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.013 PSIG during the 15 minute period.

Results: At the end of the 15 minute pressure test, the result was as follows:

Pressure loss during leak test, 0.015 PSIG.

The result of the test exceeded the allowable limit of .013 PSIG.

The following test was not a certification requirement for the CNU-399/E Maverick Missile container; however, the data is provided as additional information.

PUNCTURE TEST

Test No. 13: The pendulum puncture test was conducted in accordance with MIL-STD-1489, Method 505. The test apparatus used was a simulated forklift tine weighing 70 pounds, suspended from a height of 14 feet above the floor by wire cables (Figures 11 and 12). One tine was gradually pulled straight back until it reached a height of 20 inches above its equilibrium height and released. The tine impact was made to each side of the container at 1 1/2 inches above the enclosed forklift pocket.

Results: Visual inspection revealed slight damage at the impact area on both sides of the container.

LEAK TEST

Test No. 14: The pneumatic pressure/vacuum retention test was conducted in accordance with FTMS No. 101, Method 5009.1. The test was performed at 1.00 PSIG. The failure criteria for the test was 0.050 PSIG for a 60 minute period.

Results: The pressure leak test was discontinued after 15 minutes since a pressure loss of 0.047 PSIG was recorded at the end of the 15 minute period. Inspection with a General Electric, Industrial Halogen Leak Detector, Cat. No. 50-42081OHFJKI revealed no leakage to the one side impacted by the tine. However, excessive leakage was detected and accounted for most of the 0.047 PSIG pressure loss on the opposite side that was impacted by the tine.

The following tests also were not contractual performance certification requirements for the CNU-399/E Maverick Missile container. However, the data is provided as additional information only for those DOD personnel that requested these tests. Container Serial Number 83-0020 was used for testing. These tests were conducted after all of the qualification tests were completed using container Serial Number 83-0020.

RAIN WITH WIND SOURCE

Test No. 15: The container was placed in a rain/wind environmental chamber. The test was conducted in accordance with MIL-STD-810, Method 506.1, Procedure I. The test was modified by extending the test to eight cycles for a total of four hours.

Results: Visual inspection revealed no water entry into the container. Result of the test is acceptable.

LEAKS IN CONTAINER

Test No. 16: The water submersion test was conducted in accordance with FTMS No. 101, Method 5009.1, paragraph 6.6. The container submersion test was extended to 24 hours.

Results: Visual inspection revealed no water entry into the container. Result of the test is acceptable.

LEAK TEST

Test No. 17: The pneumatic pressure and vacuum retention tests were performed in accordance with FTMS No. 101, Method 5009.1, paragraph 1 and 6.3 at 1.00 PSIG. The failure criteria for each test was 0.050 PSIG for a 60-minute period.

Results: At the end of the 60 minute pneumatic pressure/vacuum retention test period the results were as follows:

Pressure loss during leak test, 0.018 PSIG.
Vacuum loss during leak test, 0.009 PSIG.

The results of the tests are acceptable.

FREE FALL FLAT DROP

Test No. 18: The container loaded with the heaviest all-up-round, 670 pound, inert Maverick Missile was hoisted to a height of four feet. The bottom of the container was parallel with a concrete striking surface. One drop was made at ambient temperature.

Results: Visual inspection revealed no damage to the container. Result of the test is acceptable.

Leak Test: A pneumatic pressure and vacuum retention test was performed on the container after the four foot free fall flat drop. The tests were conducted in accordance with FTMS No. 101, Method 5009.1, paragraph 6.1 and 6.3 at 1.00 PSIG. The failure criteria for each test was 0.050 PSIG for a 60-minute period.

Results: At the end of the 60 minute pneumatic pressure/vacuum retention test period the results were as follows:

Pressure loss during leak test, 0.011 PSIG.

Vacuum loss during leak test, 0.011 PSIG.

The results of the tests are acceptable.

CONCLUSIONS:

The container certification test is a safety requirement which pertains to the safe shipment of explosives in the public domain. This test was performed primarily to evaluate the container's performance in containing its contents during shipments and storage. The pneumatic pressure and vacuum retention tests used in this evaluation were performed to better evaluate the container's design and structural properties after the different test phases were completed.

The performance of the container is considered very good from a safety standpoint. The container has passed all of the certification test requirements established in the container test plan (Table 1).

The pressure/vacuum leak test results annotated outside of the 0.013 PSIG in a 15 minute period should not be interpreted as a failure of the container's capability to contain its contents.

RECOMMENDATIONS:

1. To maintain a product that will give proper protection to its contents, the AGM-65 Maverick Missile, a good quality control program should be established to maintain the integrity of this

container design throughout production.

2. Since the original weight of the container was raised from 350 pounds maximum to 380 pounds maximum and the weight of the container tested was 408 pounds, this 408 pound weight should be maintained within five percent to ensure the structural strength of the container.

3. Level 3 drawings should correspond to the dimensions of container Serial No. 83-0021. These drawings should be used in the production of the CNU-399/E Maverick Missile container.

TABLE I

AFPEA PROJECT NUMBER				
AIR FORCE PACKAGING EVALUATION AGENCY (Container Test Plan)				84-P-107
CONTAINER SIZE (L X W X D)(INCHES)		WEIGHT (LBS)		CUBE (CU. FT.)
INTERIOR	EXTERIOR:	GROSS:	ITEM:	QUANTITY
	110"x32"x30"	1078/705	670/297	61
ITEM NAME			MANUFACTURER	
AGM-65 Maverick Missile			Plastics Research Corp, Cerritos CA 90701	
CONTAINER NAME			CONTAINER COST	
CNU-399/E			N/A	
PACK DESCRIPTION				
Fiberglass Construction				
CONDITIONING				
As noted in test plan				
TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO'S	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION
	CERTIFICATION TEST	REQUIREMENTS		
	The following certification test must be performed on the Maverick container in addition to those called out in the specification before the container can be certified for safe shipment in the public domain. The container selected for these tests will be different from that used in the qualification test program.			
1.	LEAK TEST			
	Fed-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic Pressure, 1.00 PSI Vacuum Pressure, 1.00 PSI Leakage must be less than 0.050 PSI per hour.	Test at ambient condition from compressed air supply/vacuum pump.	Water Manometer
2.	REPETITIVE SHOCK			
a.	Mil-Std-648 Para 5.2.2 and Fed-Std-101 Method 5019.1 (4.2.2.1.3)	Repetitive Shock Test, test at 3 to 5 Hz or 1G whichever is less. Test for not less than 2 hours.	Test: 1. Lightest AUR w/o GU and HAS.	Tri-axial accelerometer
b.	Mil-Std-648 Para 5.2.2.1 (4.2.2.1.4)	Repetitive Shock Test with Superimposed Load, test at 3 to 5 Hz or 1G whichever is less, test for not less than 2 hours. Banding of containers shall be through the banding reliefs provided in the container.	Stack 3 high, test bottom container. Test: 1. Lightest AUR w/o GU and HAS.	Tri-axial accelerometer
3.	LEAK TEST			
	Fed-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic pressure 1.00 PSI	1. Pressure Test only to 1.00 PSI 2. Test duration	Water Manometer
COMMENTS				
PREPARED BY Edward J. Kowalski, Mech Engr			APPROVED BY RALPH ZYNDA, Chief, Design Br., AFPEA	

AIR FORCE PACKAGING EVALUATION AGENCY (Container Test Plan)					AFPEA PROJECT NUMBER 84-P-107	
CONTAINER SIZE (L X W X D)(INCHES) INTERIOR:		WEIGHT (LBS) GROSS:		CUBE (CU. FT.)	QUANTITY 1	DATE Revised 10 May 84
ITEM NAME AGM-65 Maverick Missile				MANUFACTURER Plastics Research Corp, Cerritos CA 90701		
CONTAINER NAME CNU-399/E				CONTAINER COST N/A		
PACK DESCRIPTION Fiberglass Construction						
CONDITIONING As noted in test plan						
TEST NO.	REF STD SPEC AND TEST METHOD OR PROCEDURE NO'S	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION		
4.	ROUGH HANDLING TESTS (LOW TEMPERATURE -40°F)		to be 15 minutes 3. Leakage must be less than 0.013 PSI per 15 minutes			
a.	Fed-Std-101 Method 5005.1 (4.2.2.1.3)	Low Temperature Cornerwise-drop (Rotational) Test, T= -40°F for not less than 24 hours, drop height 20 inches.	Test in chamber, one drop on diagonal bottom corners. Total of 2 drops. Test: 1. w/heaviest AUR.	Tri-Axial accelerometer		
b.	Fed-Std-101 Method 5008.1 (4.2.2.1.3)	Low Temperature Edgewise-Drop (Rotational Test, T= -40°F for not less than 24 hours, drop height 20 inches.	Test in chamber, one drop on two bottom edge, total of 2 drops. Test: 1. w/heaviest AUR.	Tri-axial accelerometer		
c.	Fed-Std-101 Method 5012 (4.2.2.1.8)	Low Temperature Pendulum-Impact Test, T= -65°F for not less than 6 hours, temperature of shock mitigation system at time of test shall be -40°F (-20/+0°F). Impact velocity 10 ft/sec. Drop height 18.6 inches.	One impact on each side and each end total of 4 impacts Test: 1. w/heaviest AUR.	Tri-axial accelerometer Thermocouples		
5.	LEAK TEST					
	Fed-Std-101 Method 5009.1	Leak Test: Pneumatic Pressure 1.00 PSI	1. Pressure Test only to 1.00 PSI	Water Manometer		
COMMENTS						
PREPARED BY Edward J. Kowalski, Mech Engr				APPROVED BY RALPH ZYNDA, Chief, Design Br., AFPEA		

AIR FORCE PACKAGING EVALUATION AGENCY (Container Test Plan)					AFPEA PROJECT NUMBER 84-2-107	
CONTAINER SIZE (L X W X D)(INCHES)		WEIGHT (LBS)		CUBE (CU. FT.)	QUANTITY	DATE Revised 10 May 84
INTERIOR:	EXTERIOR:	GROSS:	ITEM:			
ITEM NAME AGM-65 Maverick Missile				MANUFACTURER Plastic Research Corp, Cerritos CA 90701		
CONTAINER NAME CNU-399/E				CONTAINER COST N/A		
PACK DESCRIPTION Fiberglass Construction						
CONDITIONING As noted in test plan						
TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO'S	TEST TITLE AND PARAMETERS		CONTAINER ORIENTATION	INSTRUMENTATION	
6.	(4.2.2.1.13)			2. Test duration to be 15 minutes. 3. Leakage must be less than 0.013 PSI per 15 minutes.		
a.	Fed-Std-101 Method 5005.1 (4.2.2.1.7)	High Temperature Cornerwise-drop (Rotational) Test, heat in chamber +140°F for not less than 24 hours, drop height 20 inches.		**Test is performed in heat chamber, one drop on diagonal bottom corners, total of 2 drops. Test: 1. Lightest AUR, w/o GU and HAS.	Tri-axial accelerometer	
b.	Fed-Std-101 Method 5008.1 (4.2.2.1.7)	High Temperature Edgewise-drop (Rotational) Test, heat in chamber +140°F for not less than 24 hours, drop height 20 inches.		**One drop to two bottom edges, total of 2 drops. Test: 1. Lightest AUR w/o GU and HAS.	Tri-axial accelerometer	
c.	Fed-Std-101 Method 5012 (4.2.2.1.7)	High Temperature Pendulum-Impact Test, heat in chamber +165°F for period not less than 6 hrs, temperature of shock mitigation system at time of test shall be +140°F (-0/+20°F). Impact velocity 10 ft/sec, drop from 18.60 inches.		One impact on each side and each end, total of 4 impacts. Test: 1. Lightest AUR, w/o GU & HAS.	Tri-axial accelerometer Thermocouples	
COMMENTS NOTE: ** These corners or edges as applicable are opposite those impacted during low temperature test.						
PREPARED BY Edward J. Kowalski, Mech Engr.				APPROVED BY RALPH ZYNDA, Chief, Design Br., AFPEA		

AFALD 4

AIR FORCE PACKAGING EVALUATION AGENCY

(Container Test Plan)

AFPEA PROJECT NUMBER

84-P-107

CONTAINER SIZE (L X W X D) (INCHES)
INTERIOR: EXTERIOR:

WEIGHT (LBS)
GROSS: ITEM

CUBE (CU FT)

QUANTITY

DATE
Revised
5 Aug 85

ITEM NAME
AGM-65 Maverick Missile

MANUFACTURER
Plastics Research Corp., Cerritos CA90701

CONTAINER NAME
CMU-399/E

CONTAINER COST
N/A

PAGE DESCRIPTION

Fiberglass Construction

CONSTRUCTION

As noted in test plan

TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO.	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION
7.	<u>LEAK TEST</u> Fed-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic Pressure, 1.00 PSI.	1. Pressure test only to 1.00 PSI. 2. Test duration to be 15 minutes. 3. Leakage must be less than 0.013 PSI per 15 minutes.	Water Manometer
8.	<u>ROUGH HANDLING TEST (AMBIENT)</u> Fed-Std-101 Method 5012 (4.2.2.1.1)	Stacked pendulum impact test, impact velocity 10 ft/sec drop height 18.60 inches. Banding of containers shall be through the banding reliefs provided on the container.	Stacked 2 high and banded, one impact on each end and each side, total of four impacts. Test w/heaviest AUR.	Tri-axial Accelerometer
9.	Fed-Std-101 Method 5005.1 (4.2.2.1.1)	Stacked cornerwise drop (rotational) test, drop height 17 inches banding shall be through the banding reliefs provided on container.	Stacked 2 high and banded, one drop on each bottom corner, total of 4 drops.	Tri-axial Accelerometer

COMMENTS:

**Revised 5 Aug 85

PREPARED BY:

Edward J. Kowalski, Mech Engr

APPROVED BY

RALPH ZYNDA, Chief, Design Br, AFPEA

17-0-10

AIR FORCE PACKAGING EVALUATION AGENCY

(Container Test Plan)

APPEA PROJECT NUMBER

84-P-107

CONTAINER SIZE (L X W X D) (INCHES)
INTERIOR: EXTERIOR:

WEIGHT (LBS)
GROSS: ITEM

CUBE (CU FT)

QUANTITY

DATE
Revised
5 Aug 85

ITEM NAME

AGM-65 Maverick Missile

MANUFACTURER

Plastics Research Corp, Cerritos CA 90

CONTAINER NAME

CBU-390/E

CONTAINER COST

N/A

PAGE DESCRIPTION

Fiberglass Construction

CONFIGURATION

As noted in test plan

TEST NO.	REF STD SPEC AND TEST METHOD OR PROCEDURE NO.	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION
** 10.	<u>LEAK TEST</u> Fed-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic pressure, 1.00 PSI.	Test w/heaviest AUR. 1. Pressure test only to 1.00 PSI. 2. Test duration to be 15 minutes. 3. Leakage must be less than 0.013 PSI per 15 minutes.	Water Manometer
11.	<u>HOISTING STRENGTH TEST</u> MIL-STD-648 Para 4.17.3.1 & 5.8.1 (4.2.2.1.12)	Hoist banded containers at one lift point and leave hanging 1 hour. Hoist banded containers loaded to 5 times gross weight (of single container) by all lift points simultaneously and leave hanging for 1 hour.	Stacked 2 high and banded. Test w/heaviest AUR.	
** 12.	<u>LEAK TEST</u> Fed-Std-101 Method 5009.1 (4.2.2.1.13)	Leak Test: Pneumatic pressure, 1.00 PSI.	1. Pressure test only to 1.00 PSI.	Water Manometer

COMMENTS

** Revised 5 Aug 85

PREPARED BY

Edward J. Kowalski, Mech Engr

APPROVED BY

RALPH ZYNDA, Chief, Design Br, APPEA

(Container Test Plan)

84-P-107

CONTAINER SIZE (L X W X D) (INCHES)		WEIGHT (LBS)		CUBE (CU FT)	QUANTITY	DATE Revised 5 Aug 85
INTERIOR:	EXTERIOR:	GROSS:	ITEM			
					1	

ITEM NAME: AGM-65 Maverick Missile
MANUFACTURER: Plastics Research Corp, Cerritos CA 90701

CONTAINER NAME: CMU-399/E
CONTAINER COST: N/A

PAGE DESCRIPTION

Fiberglass Construction

CONSTRUCTION

As noted in test plan

TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO.	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION
13.	<u>PUNCTURE TEST</u> MIL-STD-1489A Method 505	Impact will be made at a point 1-2 inches above the enclosed forklift. Pocket of the container base.	2. Test duration to be 15 minutes. 3. Leakage must be less than 0.013 PSI per 15 minutes. One impact to each side of container base, total 2 impacts.	N/A
14.	<u>LEAK TEST</u> Fed-Std-101 Method 5009.1	Leak Test: Pneumatic pressure 1.00 PSI Vacuum Test, 1.00 PSI Leakage must be less than 0.050 PSI per hour.	Test at ambient condition from compressed air supply/vacuum pump.	Water Manometer

COMMENTS: * Revised 29 Apr 85, per ASD/TAM letter 19 Apr 85.
** Revised 5 Aug 85

PREPARED BY: Edward J. Kowalski, Mech Engr
APPROVED BY: RALPH ZYNDA, Chief, Design Br, AFPEA *18w OF 18*

ARMY FORM 1

AIR FORCE PACKAGING EVALUATION AGENCY (Container Test Plan)

AFPEA PROJECT NUMBER

84-P-107

CONTAINER SIZE (L x W x D, INCHES)		WEIGHT (LBS.)		CUBIC (CU FT)	QUANTITY	DATE Revised 5 Aug 85
INTERIOR:	EXTERIOR:	GROSS:	ITEM:		1	
ITEM NAME AGM-65 Maverick Missile				MANUFACTURER Plastics Research Corp, Cerritos CA 90701		
CONTAINER NAME CNU-399/E				CONTAINER COST N/A		

ADDITIONAL DESCRIPTION

Fiberglass Construction

COMMENTS

As noted in test plan

TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO.	TEST TITLE AND PARAMETERS	CONTAINER ORIENTATION	INSTRUMENTATION
** 15.	<u>RAIN WITH WIND</u> MIL-STD-810 Method 506.1 Proc I	<u>SOURCE</u> Rain 4 inches per hour, wind velocity 40 miles per hour. Test duration 8 cycles, total 4 hours.	Place in rain/ wind Environ- ment Chamber.	N/A
** 16.	<u>LEAKS IN CONTAINER</u> Fed-Std-101 Method 5009.1 Para 6.6.	Water submersion test, total submersion of con- tainer in water for period of 24 hours.	Place in tank of water for total submersion of container.	N/A
** 17.	<u>LEAK TEST</u> Fed-Std-101 Method 5009.1 Para 6.1, 6.3	Leak Test: Pneumatic pressure, 1.00PSI Vacuum pressure, 1.00PSI Leakage must be less than 0.050PSI per hour. Test duration to be a minimum of 60 minutes.	Test at ambient con- dition from compressed air supply/vacuum pump.	Water Manometer
** 18.	<u>FREE FALL PLAT</u> U.N. Standard (Ref ICAO 4.3)	<u>DROP</u> Low temperature - free fall drop test. Drop height 4 feet. T= 0 degree fahrenheit for not	Five drops (Bottom, top, side 1, side 2 & top corner)	N/A

COMMENTS

** Revised 5 Aug 85 per ASD/TAM request.

PREPARED BY:
Edward J. Kowalak, Mech Engr

APPROVED BY: *12b of 18*
RALPH ZYNDA, Chief, Design Br. AFPEA

AIR FORCE PACKAGING EVALUATION AGENCY (Container Test Plan)					AFPEA PROJECT NUMBER 84-P-107	
CONTAINER SIZE (L X W X D) (INCHES)		WEIGHT (LBS)		CUBE (CU FT)	QUANTITY	DATE Revised 5 Aug 85
INTERIOR	EXTERIOR	GROSS	ITEM			
ITEM NAME AGM-65 Maverick Missile				MANUFACTURER Plastics Research Corp, Carritos CA 90701		
CONTAINER NAME CMU-399/B				CONTAINER COST N/A		
ITEM DESCRIPTION Fiberglass Construction						
COMMENTS As noted in test plan						
TEST NO.	REF STD/SPEC AND TEST METHOD OR PROCEDURE NO.	TEST TITLE AND PARAMETERS		CONTAINER ORIENTATION	INSTRUMENTATION	
19	ROUGH HANDLING	less than 16 hrs before test.		onto a concrete surface.		
	Fed-Std-101 Method 5008.1	Stacked edgewise-drop (rotational) test. Drop height 17 inches. Banding shall be through the banding reliefs provided on container.		Test: 1. w/heaviest AUR. 2. one container for each test.	Tri-axial Accelerometer	
	STACKING STABILITY TEST	Stacking stability test. Stack each container individually. No banding required.		Stacked 2 high and banded, one drop on each edge total of 4 drops.		
	MIL-STD-648 Para 4.16.2			Test: 1. w/heaviest AUR.	N/A	
COMMENTS ** Revised 5 Aug 85 per ASD/TAM request.						
PREPARED BY "LONAN" "RUCANABR" "ACB" Engineer				APPROVED BY "KAP" "RUCANABR" Chief Design BR		

TABLE II

Visual Inspection

U.S. Department of Transportation
Federal Motor Vehicle Safety Council

Requirement		Accept	Reject	Remarks
Weight	pounds			1100
Base Section/Cover Section				
Forklift Pockets				
Stacking Interface				
Hoisting/Tie-Down Provisions				
Desiccant Port				
Humidity Indicator				
Pressure Equalizing Valve				
Electrical Grounding Connector				
Records Receptacle				
Security Seal				Seal was made at factory and has a lock on the seal.
Weldments				
Identification/Markings				
Human Performance				
Closure Hardware				Seal is made of polyethylene and is not a self-sealing seal.
Container Seal				
Cushioning				Seal is laminated from polyethylene foam and is not a self-sealing seal.
Strapping				Seal was replaced with a new seal.
WORKMANSHIP				

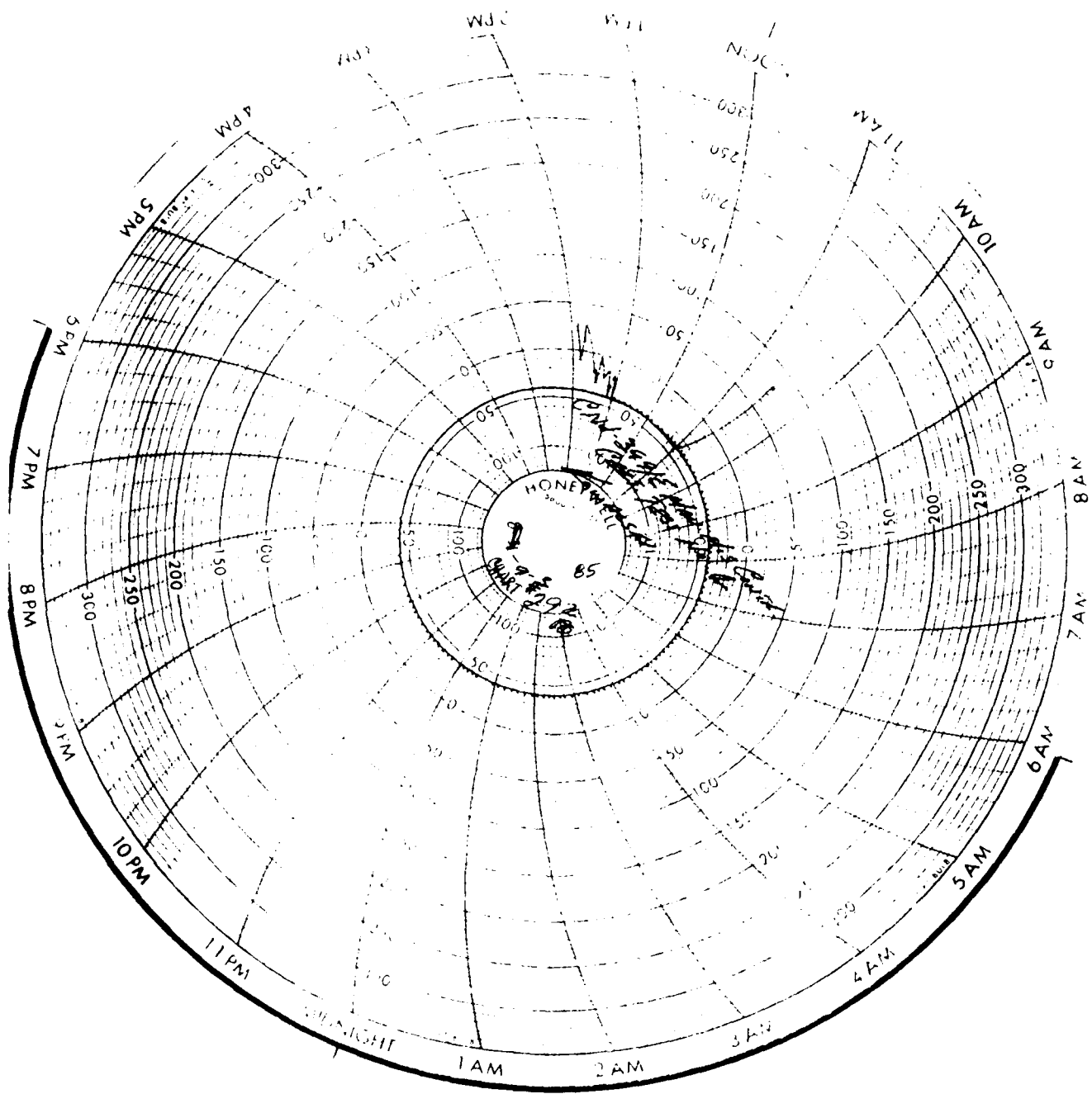


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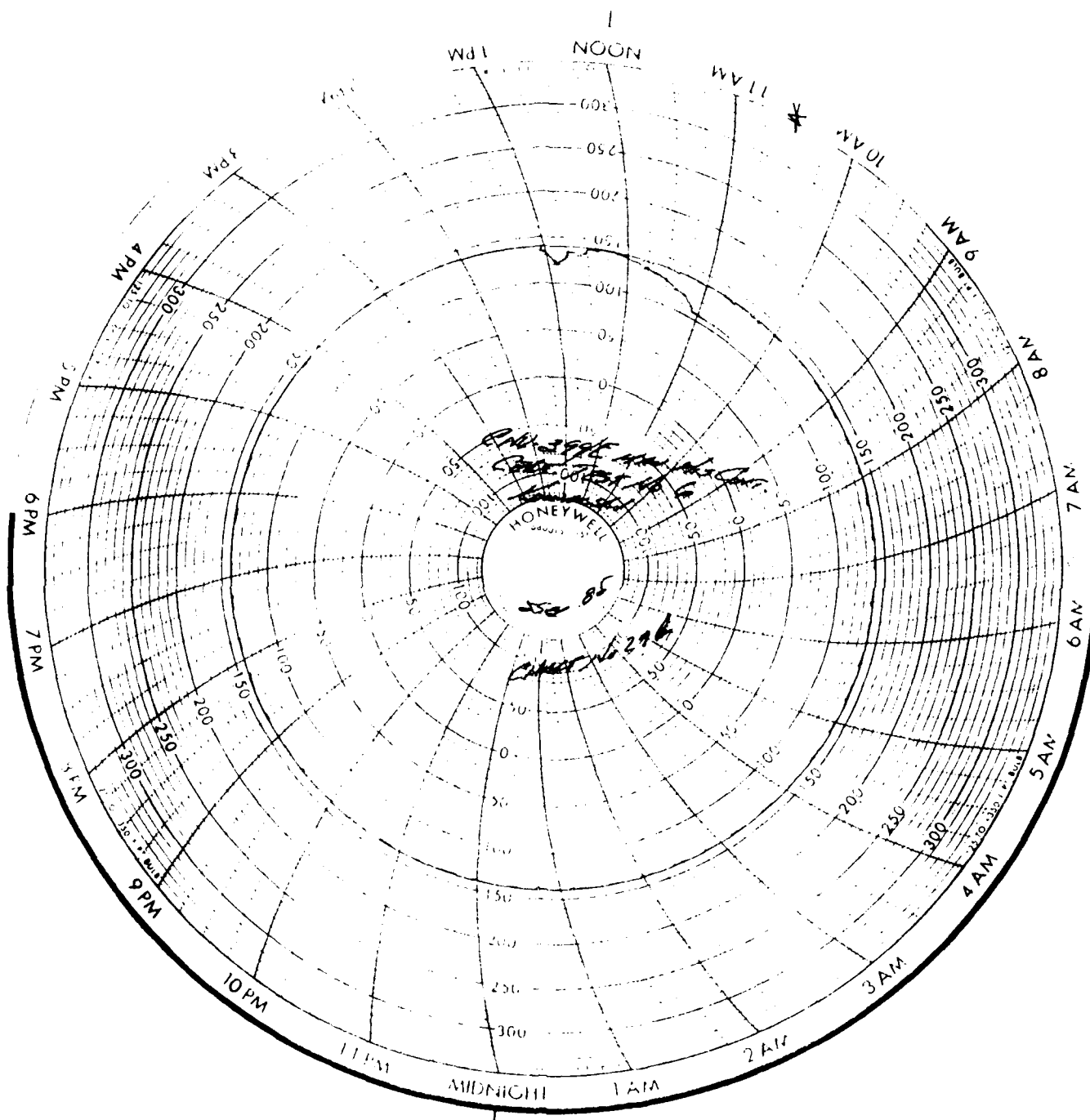


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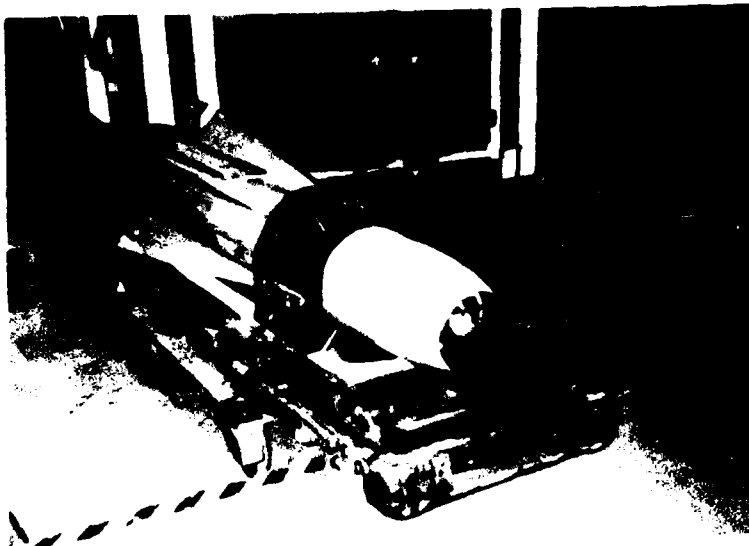


Figure 1, AFM-65
Maverick Missile
(All-Up-Round)

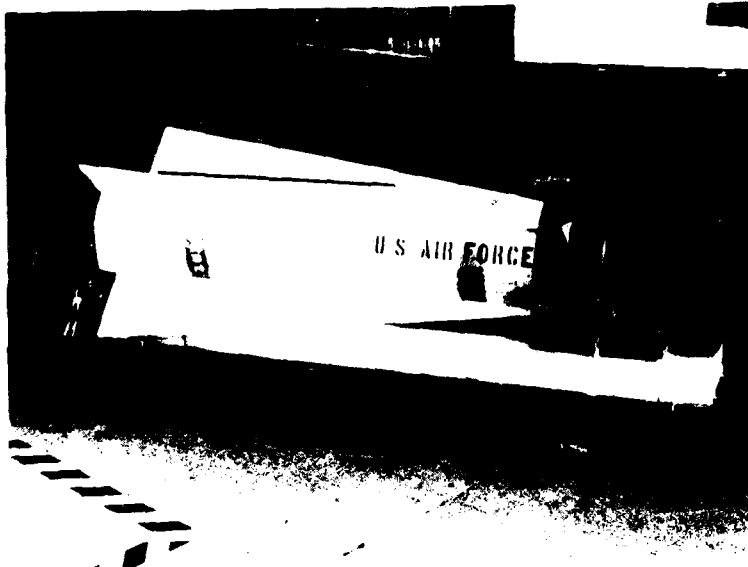


Figure 2, AGM-65
Maverick Missile
(Center Body)

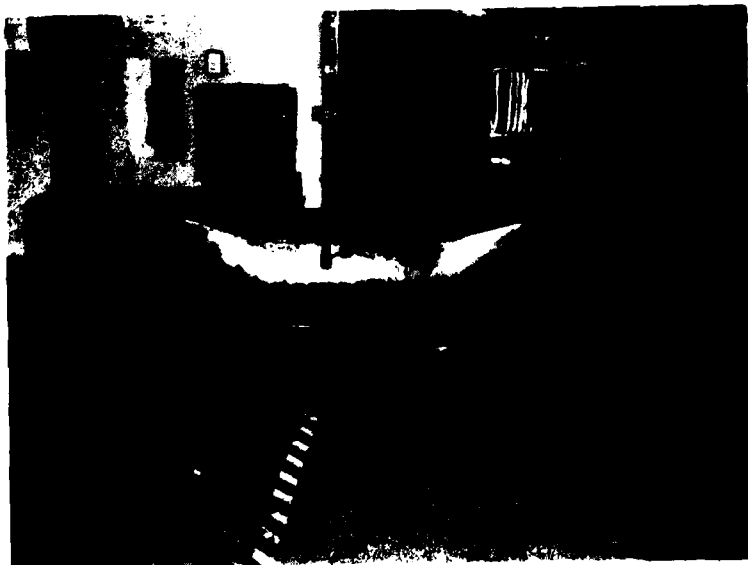


Figure 3, CNU-399/E
Maverick Missile
Container (Side View)



Figure 4, CNU-399/E
Maverick Missile
Container (End View)



Figure 5, Repetitive
Shock Test, (Stacked
Three High)

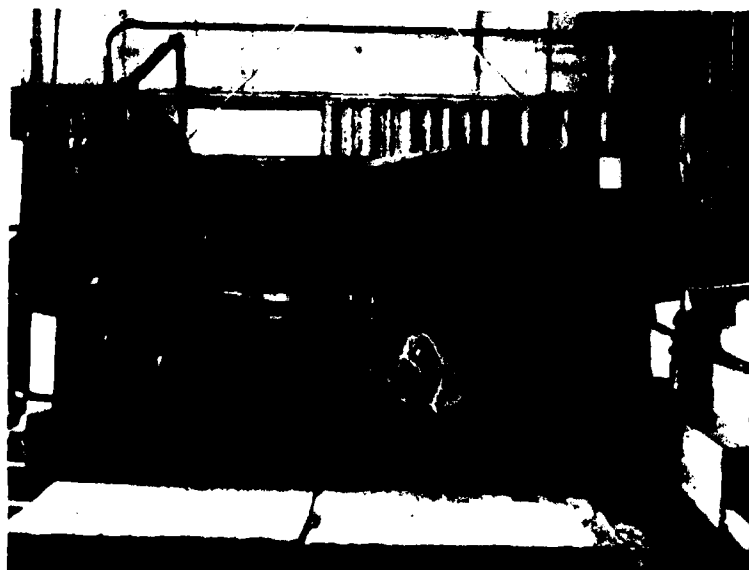


Figure 6, Pendulum-
Impact Test (Stacked
Two High)



Figure 7, Pendulum-Impact Test (Stacked Two High)

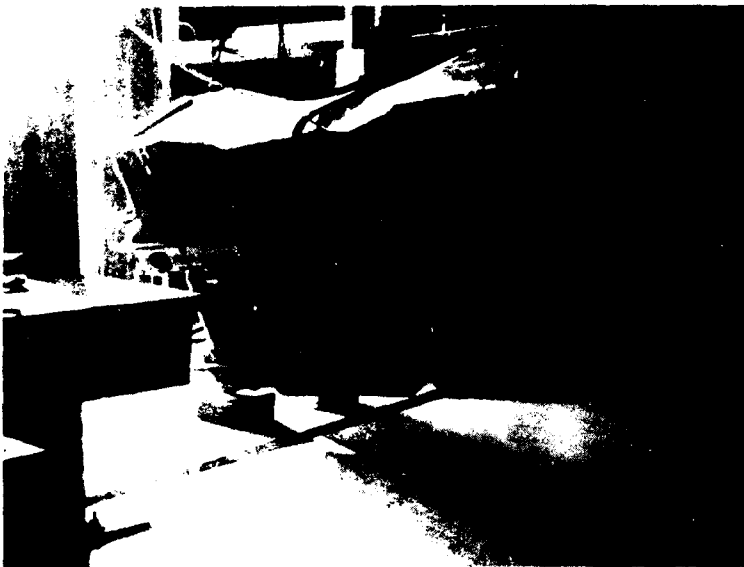


Figure 8, Cornerwise-Drop Test (Rotational) Test (Stacked Two High)



Figure 9, Hoisting Strength Test, One Lift Point

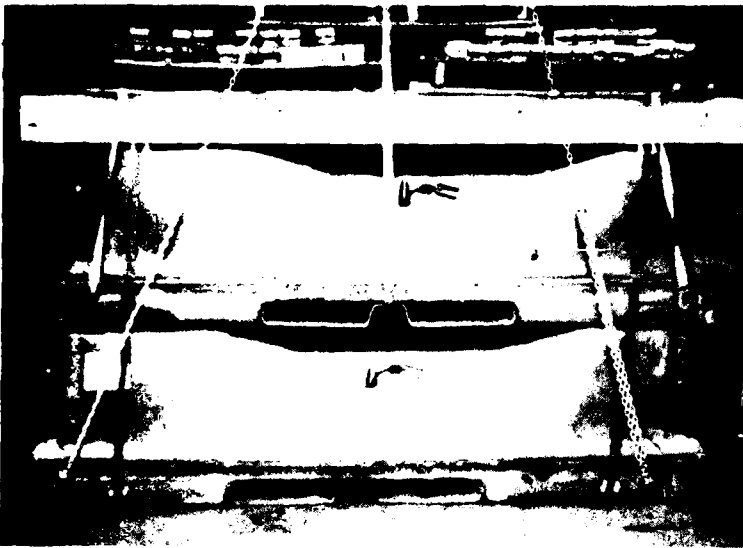


Figure 10, Hoisting
Strength Test, Four
Lift Points



Figure 11, Pendulum
Puncture Test



Figure 12, Pendulum
Puncture Test

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